REMARKS

The Office Action mailed December 4, 2003 has been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1-19 are now pending in this application. Claims 1-19 are rejected.

The objection to the drawings is respectfully traversed. Specifically, with respect to Figures 1 and 2, the label "Prior Art" has been added to each figure, and submitted herewith are replacement sheets which include the above-referenced legend changes to Figures 1 and 2. Accordingly, for at least the reasons set forth above, Applicants respectfully request the objections to the drawings be withdrawn.

The objection to the information disclosure statement under 37 C.F.R. 1.97, 1.96, and MPEP §609 is respectfully traversed. Specifically, with respect to Heller et al. (US 5,667,820) and Heller et al. (US 5,885,511), the references were submitted for consideration as an example of known modeling techniques. In order to expedite the prosecution of the present application, the Examiner may disregard or decide not to consider the above-mentioned references.

With regards to the Prelle et al. reference, Applicants submitted a supplemental information disclosure statement on June 25, 2002, listing the reference for consideration based on a June 14, 2002, PCT-International Search Report that listed the reference. In order to expedite the prosecution of the present application, the Examiner may disregard or decide not to consider the above-mentioned reference.

Accordingly, for at least the reasons set forth above, Applicants respectfully request the objections to the information disclosure statement be withdrawn.

The rejection of Claims 1 and 2 under 35 U.S.C. §101 is respectfully traversed. Specifically, Claim 1 has been amended to recite "providing at least one tube sub-system including a plurality of shrouded bellows components...determining a stiffness multiplier within each of the shrouded bellows components from input values," and as such, recites a method for predicting natural frequency responses which provides a tangible result. Claim 2

depends from Claim 1. Accordingly, for at least the reasons set forth above, Applicants respectfully request the Section 101 rejection of Claims 1 and 2 be withdrawn.

The rejection of Claims 1-19 under 35 U.S.C. § 112, first paragraph is respectfully traversed.

Applicants respectfully submit that the specification satisfies the requirements of Section 112, and that an artesian of ordinary skill in the art would understand the present invention, after reading the specification, in view of the Figures. More specifically, Applicants submit that an artisan of ordinary skill in the art would, after reading the Specification, in view of the Figures, understand the method for predicting natural frequency responses and the process recited in the claimed steps. For example, Figure 3 illustrates a method for modeling natural frequency responses in tube sub-systems. The process is further described in detail, for example, at page 4, line 5 to page 5, line 29, in the specification which describes the process by which the natural frequency is predicted.

Additionally, Applicants submit that one skilled in the art would understand the stiffness multiplier as described in the specification. For example, at page 4, lines 20-25, the specification defines a stiffness multiplier as a finite element input based on dynamic stiffness component test data.

Moreover, Applicants submit that one skilled in the art would understand using the process of using the determined stiffness multiplier in a model to predict a natural frequency response and the process of determining the stiffness multiplier as described in the specification. For example, at page 4, lines 20-25, the specification describes that the stiffness multiplier is determined with a regression equation that accounts for tube sub-system diameter, system operating pressure, bellows pitch, and dynamic system operating inputs.

Furthermore, Applicants submit that one skilled in the art would understand the technique used to determine the stiffness multiplier as described in the specification. For example, at page 4, lines 27 to page 5, line 9, the specification describes a technique used to determine the stiffness multiplier, and that in the exemplary embodiment, a regression equation is used that is based on dynamic stiffness test data that accounts for tube sub-system diameter, system operating pressure, bellows pitch, and dynamic system operating inputs.

In addition, Applicants submit that one skilled in the art would understand how to determine system stiffness as a function of the stiffness multiplier as described in the specification. For example, at page 4, lines 27 to page 5, line 9, the specification describes how to determine system stiffness using a regression equation based on dynamic stiffness test data that accounts for tube sub-system diameter, system operating pressure, bellows pitch, and dynamic system operating inputs to determine the stiffness multiplier.

Additionally, Applicants submit that one skilled in the art would understand how the stiffness multiplier is used to determine natural frequency response. For example, at page 4, lines 11 to page 5, line 29, the specification describes how the stiffness multiplier is used to determine natural frequency response.

Furthermore, Applicants submit that one skilled in the art would understand how the stiffness multiplier is determined using a regression technique. For example, at page 4, lines 27 to page 5, line 9, the specification describes utilizing a regression equation based on dynamic stiffness test data that accounts for tube sub-system diameter, system operating pressure, bellows pitch, and dynamic system operating inputs to determine the stiffness multiplier.

In addition, Applicants submit that one skilled in the art would understand the input values needed to determine the stiffness multiplier. For example, at page 4, lines 11-19, the specification describes how input values for dynamic operating condition inputs and shrouded bellows geometry inputs are chosen.

Moreover, Applicants submit that one skilled in the art would understand the regression technique used to determine the multiplier. For example, at page 4, line 27 to page 5, line 9, the specification describes how a regression equation based on dynamic stiffness test data that accounts for tube sub-system diameter, system operating pressure, bellows pitch, and dynamic system operating inputs is used to determine the stiffness multiplier.

Lastly, Applicants submit that one skilled in the art would understand how the regression technique uses a regression equation to determine a stiffness multiplier. For example, at page 4, line 27 to page 5, line 9, the specification describes how a regression equation based on dynamic stiffness test data that accounts for tube sub-system diameter,

system operating pressure, bellows pitch, and dynamic system operating inputs is used to determine the stiffness multiplier.

For at least the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 1-19 be withdrawn.

The rejection of Claims 1-19 under 35 U.S.C. § 112, second paragraph is respectfully traversed.

Applicants respectfully submit that Claims 1-19 satisfy the requirements of Section 112. More specifically, Applicants respectfully submit that an artesian of ordinary skill in the art would understand the invention, after reading the specification, in view of the Figures. Regarding Claims 1, 15, and 18, at page 4, lines 20-25, within the specification for example, the term stiffness multiplier is defined. Regarding Claims 2, 16, and 17, at page 4, lines 12-13, for example, the specification defines the dynamic system operating inputs. With respect to Claim 3, at page 4, lines 11-19, for example, the specification describes the vibratory environment. At page 4, lines 11-19, for example, the specification describes the standard or required inputs as recited in Claim 4. With respect to Claims 5 and 19, at page 4, line 27 to page 5, line 9, for example, the specification describes the regression techniques. Regarding Claim 6, at page 5, lines 2-5, for example, the specification describes that the different shrouded bellows configurations can be analytically modeled to determine a unique stiffness multiplier for that specific shrouded bellows configuration and to generate a tube sub-system analytical model. In addition, Claim 7 has been amended to include a transitional phrase and recites "said system comprising a processor configured to determine a stiffness multiplier from input values."

For at least the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claims 1-19 be withdrawn.

The rejection of Claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by Algor's ALG/NASTAN™ ("Algor") software is respectfully traversed

Algor describes a software package used to determine a complete NASTRAN™ solution for static stress using linear material models, natural frequency (modal), critical buckling load, and steady-state heat transfer analysis. The natural

frequency analysis determines a part's natural frequencies and mode shapes. It can determine if a part resonates at the frequency of an attached, power-driven device, such as a motor. Notably, Algor does not describe nor suggest determining a stiffness multiplier within each of the shrouded bellows components based on input values and using the determined stiffness multiplier in a model to predict a natural frequency response.

Applicants respectfully submit that the Section 102(b) rejection of the presently pending claims is not a proper rejection. Applicants have not been provided with either a "first installed" date, "released" date, or publication date as is required by In re Epstein and MPEP 2128. Specifically, where "publications are properly relied as providing evidence that the software products referenced therein were "first installed" or "released" more than one year prior to applicant's filing date." In re Epstein, 32 F.3d 1559 (Fed Cir 1994). Moreover, "[i]f the publication does not include a publication date (or retrieval date), it cannot be relied upon as prior art under 102(a) or (b)...." MPEP 2128. The Applicants have been provided with a retrieval date of November 28, 2003 which falls after Applicants' filing date of August 31, 2000. Accordingly, for at least this reason, Applicants request that the Section 102 rejection of Claims 1 and 2 be withdrawn.

Moreover, Claim 1 recites a method for predicting natural frequency responses, wherein the method comprises "providing at least one tube sub-system including a plurality of shrouded bellows components...determining a stiffness multiplier within each of the shrouded bellows components from input values...and using the determined stiffness multiplier in a model to predict a natural frequency response."

Algor does not describe nor suggest a method for predicting natural frequency responses, wherein the method includes providing at least one tube sub-system including a plurality of shrouded bellows components, determining a stiffness multiplier within each of the shrouded bellows components from input values, and using the determined stiffness multiplier in a model to predict a natural frequency response. Specifically, Algor does not describe nor suggest a method that includes determining a stiffness multiplier within each of the shrouded bellows components from input values and using the determined stiffness multiplier in a model to predict a natural frequency response. Rather, in contrast to the

present invention, Algor describes a software program capable of determining solutions for static stress with linear models and a part's natural frequency. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Algor.

Claim 2 depends from independent Claim 1. When the recitations of Claim 2 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claim 2 likewise are patentable over Algor.

For the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1 and 2 be withdrawn.

The rejection of Claims 3-19 under 35 U.S.C. § 103 as being unpatentable over Algor in view of Applicants' Own Admission is respectfully traversed.

Algor is described above. Applicants' Own Admission describes shrouded bellows that are typically located in various locations within and around the engine. To design shrouded bellows and associated hardware to withstand High Cycle Fatigue (HCF) stresses, modeling techniques are used to predict natural frequency responses in the ducting systems including the shrouded bellows components.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify Algor in view of applicants' Own Admission. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Algor nor Applicants' Own Admission, considered alone or in combination, describes or suggests the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Algor with Applicants' Own Admission because there is no motivation to combine the references suggested in the art. Rather, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicants' own teaching. Only the conclusory statement that "[o]ne of ordinary skill in the art, at the time of the invention, would apply the ALG/NASTAN™ software package to shrouded bellows because the

applicants have admitted that shrouded bellows are typically located around various locations within and around an engine" suggests combining the disclosures.

More specifically, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, "to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01.

Moreover, the Federal Circuit has determined that:

> [I]t is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, "it is impermissible . . . to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991).

The present Section 103 rejection is based on a combination of teachings selected in an attempt to arrive at the claimed invention. Specifically, Algor is cited for a software program that determines a part's natural frequency, and Applicants' Own Admission is cited for stating that shrouded bellows are typically located around various locations within and around an engine. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 3-20 be withdrawn.

In addition, in the present case, neither a suggestion nor motivation to combine the cited art, nor any reasonable expectation of success has been shown. More specifically, neither Algor nor Applicants' Own Admission, considered alone or in combination, describes or suggests a method for predicting natural frequency responses, wherein the method includes providing tube sub-systems including shrouded bellows components, determining a stiffness multiplier within the shrouded bellows components from input values, and using the determined stiffness multiplier in a model to predict a natural frequency response.

While Applicants do agree that engine sub-systems and components were analyzed in the past to determine natural frequencies, Applicants respectfully submit that it would not have been obvious to evaluate such engine sub-systems using a method for predicting natural frequency responses, wherein the method includes providing tube sub-systems including shrouded bellows components, determining a stiffness multiplier within the shrouded bellows components from input values, and using the determined stiffness multiplier in a model to predict a natural frequency response. Rather, as described in the specification, in the past, modeling techniques used analytical models that approximated shrouded bellows natural frequency response with manufacturer-supplied test data, wherein the test data was typically obtained from static stiffness component testing. In contrast, the present invention uses test data from dynamic operating conditions testing. Accordingly, Applicants respectfully submit that the cited art teaches away from the present invention.

If art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicants respectfully submit that the combination of Algor and Applicants' Own Admission teach away from each other, as well as from the present invention, and as such, there is no suggestion or motivation to combine Algor and Applicants' Own Admission.

Further, and to the extent understood, neither Algor nor Applicants' Own Admission, considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination.

Specifically, Claim 3 depends from Claim 1 which recites a method for predicting natural frequency responses, wherein the method comprises "providing at least one tube sub-system including a plurality of shrouded bellows components...determining a stiffness multiplier within each of the shrouded bellows components from input values...and using the determined stiffness multiplier in a model to predict a natural frequency response."

Neither Algor nor Applicants' Own Admission, considered alone or in combination, describe or suggest a method for predicting natural frequency responses, wherein the method includes providing at least one tube sub-system including a plurality of shrouded bellows components, determining a stiffness multiplier within each of the shrouded bellows components from input values, and using the determined stiffness multiplier in a model to predict a natural frequency response. Specifically, neither Algor nor Applicants' Own Admission, considered alone or in combination, describe or suggest a method that includes determining a stiffness multiplier within each of the shrouded bellows components from input values and using the determined stiffness multiplier in a model to predict a natural frequency response. For at least the reasons set forth above, Claim 1 is submitted to be patentable over Algor in view of Applicants' Own Admission.

Claims 3-6 depend from independent Claim 1. When the recitations of Claims 3-6 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 3-6 likewise are patentable over Algor in view of Applicants' Own Admission.

Claim 7 recites a modeling system for determining natural frequency response of shrouded bellows components, wherein the system includes "a processor configured to determine a stiffness multiplier from input values."

Neither Algor nor Applicants' Own Admission, considered alone or in combination, describe or suggest a modeling system for determining natural frequency response of shrouded bellows components, wherein the system includes a processor configured to determine a stiffness multiplier from input values. Specifically, neither Algor nor Applicants' Own Admission, considered alone or in combination, describe or suggest a modeling system that includes a processor configured to determine a stiffness multiplier from input values. For at least the reasons set forth above, Claim 7 is submitted to be patentable over Algor in view of Applicants' Own Admission.

Claims 8-13 depend from independent Claim 7. When the recitations of Claims 8-13 are considered in combination with the recitations of Claim 7, Applicants submit that dependent Claims 8-13 likewise are patentable over Algor in view of Applicants' Own Admission.

Claim 14 recites a system for determining natural frequency response of shrouded bellows components, wherein the system includes "a model configured to predict the natural frequency response as a function of a stiffness multiplier."

Neither Algor nor Applicants' Own Admission, considered alone or in combination, describe or suggest a system for determining natural frequency response of shrouded bellows components, wherein the system includes a model configured to predict the natural frequency response as a function of a stiffness multiplier. Specifically, neither Algor nor Applicants' Own Admission, considered alone or in combination, describe or suggest a system that includes a model configured to predict the natural frequency response as a function of a stiffness multiplier. For at least the reasons set forth above, Claim 14 is submitted to be patentable over Algor in view of Applicants' Own Admission.

Claims 15-19 depend from independent Claim 14. When the recitations of Claims 15-19 are considered in combination with the recitations of Claim 14, Applicants submit that dependent Claims 15-19 likewise are patentable over Algor in view of Applicants' Own Admission.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

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